REMARKS/ARGUMENTS

This case has been reviewed and analyzed in view of the Official Action dated 10 December 2003. Responsive to the rejections made by the Examiner in the Official Action, Claims 1-5, 7, 11, 12, 15, and 26-27 have now been amended to more clearly clarify the inventive concept of the Applicant. Additionally, Claims 20-25 have now been canceled from this case responsive to the Restriction Requirement and Applicant's subsequent election of Group I.

It is respectfully noted that the Examiner has allowed Claim 19.

The Examiner has objected to the Specification under 37 C.F.R. § 1.52(b)(4) for not having an Abstract of the Disclosure commencing on a separate sheet. A new Abstract of the Disclosure has now been inserted on a separate sheet.

Prior to a discussion of the Examiner's further objections and rejections made in the outstanding Official Action, it is believed that it would be beneficial to briefly review the subject Patent Application system. The subject Patent Application system and method is directed to the quantitative imaging of dielectric permittivity and tunability. The method for contact imaging of dielectric permittivity begins with a calibration step in order to determine the geometry descriptor of the probe tip of the near-field scanning microwave microscope. A resonant frequency of the near-field scanning microwave microscope is selected and at least two calibration samples are scanned, bringing the probe tip into contact with each of the at least two calibration samples. Calibration

curves are then generated and the test sample is brought into contact with the probe tip at a variety of predetermined scanning locations in order to generate at least one test sample frequency shift value at each of the scanning locations. The dielectric permittivity may then be determined for the test sample at the sample locations based on the respective generated test sample frequency shift values and the generated calibration curves.

The Examiner has rejected Claims 1, 11, and 26 under 35 U.S.C. § 102(a) as being anticipated by the Xiang Patent #6,173,604. It is the Examiner's contention that all elements of Claims 1, 11, and 26, as originally filed, are taught by the Xiang reference.

The Xiang reference is directed to a scanning evanescent electro-magnetic microscope. Fig. 1 illustrates the microwave cavity 10 having a generator 30 electrically connected to the cavity 10 to feed an input signal through coaxial line 32, into a coupled loop input 12 on cavity 10. The coupled loop output 14 of cavity 10 is connected to a detector 40 through a second coaxial line 42. Detector 40, in turn, feeds the output signal to a data acquisition unit 50.

By varying the tip-sample separation over a metallic substrate, the frequency response can be measured. From the generated calibration curves, a frequency f_{RF} is chosen to correspond to some tip-sample separation. To regulate the tip-sample distance, a phase-locked loop is employed, where connection 31 of Fig. 2 is open. A constant RF frequency f_{RF} is input into the cavity and the cavity output is mixed with a signal coming from a reference path. The length of the reference path is adjusted so that the output of

the mixer is zero when f_r matches f_{RF}. The output of the phase detector is fed to an integrator, which regulates the tip-sample distance by changing the extension of a piezoelectric actuator to maintain the integrator output near zero.

The Xiang reference, however, does not teach or suggest the selection of a resonant frequency of the near-field scanning microwave microscope during the calibration process. The selection step allows for the fine tuning of the calibration and provides for a far more accurate calibration method which subsequently produces greater accuracy in the scanning results.

Additionally, the Xiang reference does not teach the use of multiple calibration samples. In order to enhance accuracy, multiple samples are required because a single calibration sample may be damaged or flawed, thus producing inaccurate calibration results. The system of the subject Patent Application utilizes both the selection of a resonant frequency of the near-field scanning microwave microscope and further includes the use of at least two calibration samples in order to provide the greatest accuracy in calibrating the near-field scanning microwave microscope, thus producing the highest available accuracy in scan results.

Thus, the Xiang reference does not provide for: "...selection of a resonant frequency of the near-field scanning microwave microscope...scanning each of at least two calibration samples...", as is clearly provided by newly-amended Independent Claim 1. Further, the Xiang reference does not provide for: "...calibrating the near-field

scanning microwave microscope using at least three dielectric samples with known dielectric properties...selection of a resonant frequency of the near-field scanning microwave microscope...", as is further provided in newly-amended Independent Claim 26.

Thus, based upon the newly-amended Independent Claims 1 and 26, it is not believed that the subject Patent Application is anticipated by, or made obvious by, the Xiang reference when Independent Claims 1 and 26 are carefully reviewed.

It is now believed that the remaining Claims 2-18 and 27-29 show patentable distinction over the prior art cited by the Examiner for at least the same reasons as those previously discussed for Independent Claims 1 and 26.

The remaining references cited by the Examiner but not used in the rejection have been reviewed, but are believed to be further removed when patentable distinctions are taken into account than those cited by the Examiner in the rejection.

It is now believed that the subject Patent Application has been placed in condition for allowance, and such action is respectfully requested.

Respectfully submitted,

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